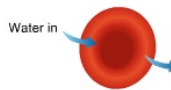



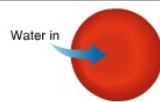



# Tonicity

Tonicity is a measure of the osmotic pressure (as defined by the water potential of the two solutions) of two solutions separated by a semipermeable membrane.

The Effects of Osmosis on Cells		
Solution	Animal Cell	Plant Cell
<b>Isotonic:</b> The concentration of solutes is the same inside and outside the cell.		
<b>Hypertonic:</b> Solution has a higher solute concentration than the cell.		
<b>Hypotonic:</b> Solution has a lower solute concentration than the cell.		

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Solute – substance being dissolved in the solution.

Solvent - substance in which a solute is dissolved to form a solution.

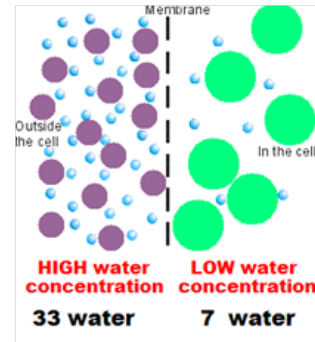
Concentration - the amount of solute per unit of solvent.

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[http://www.phschool.com/atschool/phbio/active\\_art/osmosis/index.html](http://www.phschool.com/atschool/phbio/active_art/osmosis/index.html)

## Reminder

- Osmosis is the flow of water down the concentration gradient (from an area of high concentration to an area of low concentration)

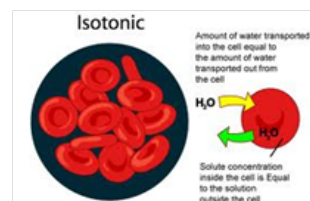
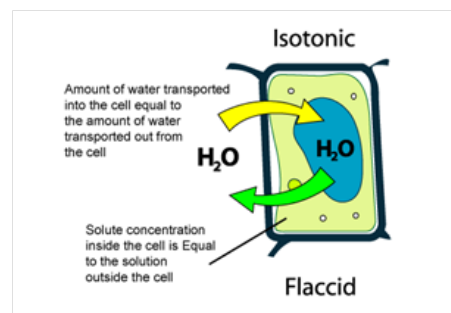


Water molecules never stop moving, even when equilibrium has been reached.

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## Isotonic

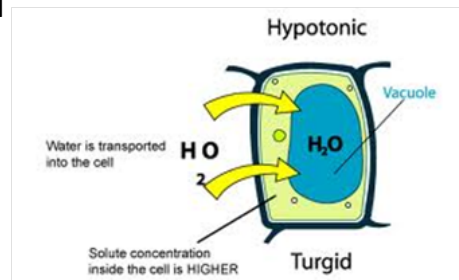
- The concentration of dissolved substances is the same inside and outside of the cell.
- The net movement of water across the semipermeable membrane is **equal**.



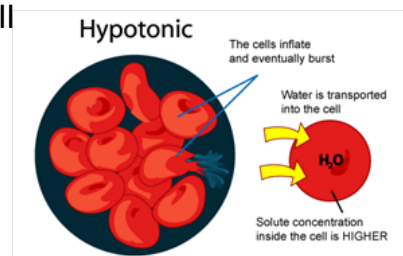
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## Hypotonic

- The concentration of dissolved substances is higher inside the cell than outside. The concentration will try to even out.
- Water will enter the cell. This causes the cell to swell (get larger) until it may burst.



A cell placed in fresh water will burst because the osmotic pressure will cause water to move into the cell.

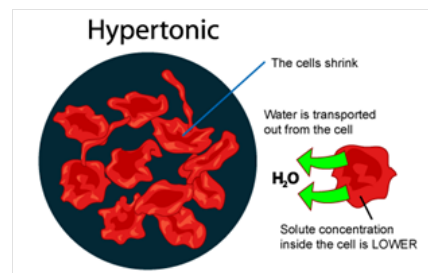
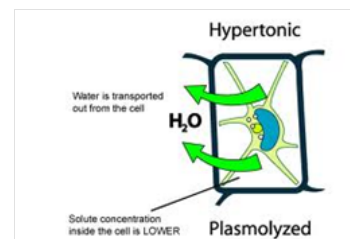


PUTTING A CELL IN Pure WATER

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## Hypertonic

- The concentration of substances outside of the cell is higher than inside of the cell. The concentration will try to even out.
- Water will leave the cell. This causes the cell to shrink (get smaller)



PUTTING A CELL IN SALT WATER

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# Tonicity

Tonicity of Solution	Concentration of Solute (outside of cell)	Concentration of Solute (inside of cell)	Net Movement	End Product
Isotonic	Same as cell	Same as outside	None	None
Hypotonic	Less than cell	More than outside	Cell gains water	Swells, turgor pressure
Hypertonic	More than cell	Less than outside	Cell loses water	Shrinks

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